REMARKS/ARGUMENTS

35 U.S.C. §112 Rejection

Claims 1-11 were rejected under 35 U.S.C. §112, first paragraph. This rejection was discussed in a telephone interview between the Examiner and the undersigned on January 31, 2006. The Examiner expressed the position that claim 1 is broader than the disclosed invention. The Office Action states that the specification does not enable any mechanisms, liquids or physical cleaning "except for the specifically disclosed ones...."

The applicants do not agree. The application discloses three mechanical embodiments (Figs. 1, 3 and 4), several oxidation liquids (pages 20-22) and several etching liquids (pages 20-22).

The Office Action's position would require several dozen independent claims if only the specific disclosed mechanisms, oxidation liquids, additives and etching liquids could be claimed and no generic terms could be used. The applicants cannot agree and submit that the larger number of disclosed embodiments and materials justifies the broad scope of claim 1.

In any event, claim 1 is being amended herein. Reconsideration is requested.

Prior Art Rejections

Claims 1 through 7 have been rejected as being anticipated by Sato et al. Claims 1 through 11 have been rejected as being anticipated by Ohmi et al. In response to the rejection, claims 1, 2, 4, 5, 6, 8 and 11 are being amended and claims 3 and 7 are being cancelled.

The amended claim 1 corresponds to the structure shown in Figure 1 of the present application. That is, the amended Claim 1 clarifies that the oxidation liquid supply mechanism includes an oxidation liquid nozzle, that the physical cleaning mechanism includes a dual fluid spray nozzle, and that the etching liquid supply mechanism includes an etching liquid nozzle. Dependent Claims 2, 4, 5 and 6 have been amended in conformity with the amended Claim 1.

Method claim 8 has been amended to clarify that the physical cleaning step includes at least one of the following steps (a) and (b):

(a) a step of supplying a jet flow of droplets of a treatment liquid to the substrate surface from a dual fluid spray nozzle that blows a gas on the treatment liquid ejected toward the substrate surface to generate the jet flow of droplets,

(b) a step of imparting ultrasonic vibration to a treatment liquid supplied or to be supplied to the substrate surface.

Claims 9 through 11 remain as originally filed. New method claims 15-22 are supported by pages 20-22 and depend from claim 8.

Claims 12, 13 and 14 are new apparatus claims. Claim 12 corresponds to the structure shown in Figure 3 of the present application. Claims 13-14 correspond to the structure shown in Figure 4 of the present application.

Sato et al. disclose a substrate processing apparatus provided with a gas-liquid mixing nozzle for generating a gas-liquid mixture by mixing a liquid and a pressurized gas in order to improve the quality of the particle removal process. In paragraph [0036] of their publication, there is an indication that "The liquid to be used is not limited to deionized water, and, for example, extra-pure water (extra-deionized water) may be used. Moreover, any one of chemical liquids (for example, hydrofluoric acid, sulfuric acid, hydrochloric acid, nitric acid, phosphoric acid, acetic acid, ammonia or a hydrogen peroxide water liquid of these) may be used."

Further, in paragraph [0072] of their publication, there is an indication that "a mixed gas of air and a gas that improves the cleaning degree when mixed with air may be used, or a gas that simply improves the cleaning degree, such as ozone gas, carbon dioxide or hydrogen, may be supplied."

Ohmi et al., on the other hand, disclose: a step of supplying ozone-added ultrapure water to oxidize organic contaminants on the surface of a wafer and at the same time to form an oxide film on the surface; a step of supplying a mixture of hydrofluoric acid, hydrogen peroxide, and ultrapure water to separate native oxides on the surface; a step of supplying a mixture of ammonium hydroxide, hydrogen peroxide, and ultrapure water to remove the particulates on the surface; and a step of supplying a mixture of hydrofluoric acid, hydrogen peroxide, and ultrapure water to separate native oxides again.

However, neither Sato et al. nor Ohmi et al. discloses or suggests the specific structures disclosed in the present application. For example, the structure of Figure 1 has an HF nozzle 3, a soft spray nozzle 4, and an ozone water nozzle 2. The structure of Figure 3 of the present application has an HF nozzle 3 and a soft spray nozzle 4 which supplies a jet flow of droplets of

oxidation liquid. The structure of Figure 4 of the present application has an ultrasonic nozzle 48 or an ultrasonic vibrator 49. These structures support the features now recited in claims 1, 12 and 13. Sato et al. and Ohmi et al. are both silent about the claimed combinations of nozzles.

In view of the foregoing, independent Claims 1, 12, and 13 are respectively distinguishable from the teachings of Sato et al. and Ohmi et al.

The independent method Claim 8 is currently rejected as being anticipated by Ohmi et al.; however, Ohmi et al. are silent about either a dual fluid spray nozzle or physical cleaning by use of ultrasonic vibration, so that amended Claim 8 is distinguishable from the teachings of Ohmi et al.

In view of the foregoing amendments and remarks, reconsideration and allowance of claims 1-2, 4-6 and 8-22 is requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on February 6, 2006:

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